# Large Language Model based Multi-Agents: A Survey of Progress and Challenges

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## Abstract

Large Language Models (LLMs) have achieved remarkable success across a wide array of tasks. Due to their notable capabilities in planning and reasoning, LLMs have been utilized as autonomous agents for the automatic execution of various tasks. Recently, LLM-based agent systems have rapidly evolved from single-agent planning or decision-making to operating as multi-agent systems, enhancing their ability in complex problem-solving and world simulation. To offer an overview of this dynamic field, we present this survey to offer an in-depth discussion on the essential aspects and challenges of LLM-based multi-agent (LLM-MA) systems. Our objective is to provide readers with an in-depth understanding of these key points: the domains and settings where LLM-MA systems operate or simulate; the profiling and communication methods of these agents; and the means by which these agents develop their skills. For those interested in delving into this field, we also summarize the commonly used datasets or benchmarks. To keep researchers updated on the latest studies, we maintain an open-source GitHub repository (github.com/taichengguo/LLM_MultiAgents_Survey_Papers), dedicated to outlining the research of LLM-MA research.